

WHAT IS CLAIMED IS:

1 1. An observing tool comprising an observation target
2 storage section having a mirror.

1 2. An observing tool used for storing an observation
2 target that is used in an observing method which
3 observes an observation target, by illuminating the
4 target with vertical lighting via an optical system
5 having an objective lens, comprising an reflection
6 plane which reflects said vertical lighting when the
7 observation is performed.

1 3. The observing tool according to claim 2, wherein,
2 said reflection plane is provided on a surface
3 to be facing to the objective lens when the observation
4 is performed.

1 4. The observing tool according to claim 2, wherein,
2 said reflection plane is provided on a surface
3 opposite to the surface that is to be facing to the
4 objective lens when the observation is performed.

1 5. The observing tool according to any one of claims
2 2 to 4, comprising,

3 a flow-channel which said observation target
4 passes through.

1 6. The observing tool according to any one of claims
2 2 to 5, wherein,

3 a storage section to store said observation target
4 comprises an inlet to inject liquid containing the
5 observation target, and an outlet to flow the liquid
6 out.

1 7. An observing method which observes an observation
2 target by illuminating the target with vertical
3 lighting via an optical system having an objective lens,
4 wherein,

5 an observing tool which stores said observation
6 target is provided with a reflection plane to reflect
7 said vertical lighting when observation is performed,
8 and

9 said observation target is stored in said
10 observing tool and said observation target is
11 observed.

1 8. The observing method according to claim 7, wherein,
2 said reflection plane is provided on a surface to
3 be facing to the objective lens when the observation

4 is performed.

1 9. The observing method according to claim 7, wherein,
2 said reflection plane is provided on a surface
3 opposite to the surface that is to be facing to the
4 objective lens when the observation is performed.

1 10. The observing method according to any one of claims
2 7 to 9,
3 said observation target is a micro transparent
4 object.

1 11. The observing method according to any one of claims
2 7 to 10, wherein,
3 said observing tool has a container to hold liquid,
4 and
5 said container stores the observation target with
6 the liquid containing the observation target.

1 12. The observing method according to claim 11,
2 wherein,
3 said observation target is a cell, and
4 said liquid is a culture solution.

1 13. The observing method according to any one of claims

2 7 to 12, wherein,

3 said observation target is stored in said
4 observing tool so that a distance between said
5 observation target and said reflection plane becomes
6 a half or less than the focal depth of said optical
7 system.

1 14. The observing method according to any one of claims
2 7 to 13, wherein,

3 said observation target is stored in said
4 observing tool so that distance d between the
5 observation target and the reflection plane satisfies
6 the following formula (1),

7
$$d \leq W/(2NA^2) \dots (1)$$

8 (in the formula, d represents the distance between
9 the observation target and the reflection plane, W
10 represents a wavelength of the light employed in the
11 observation, and NA represents a numerical aperture
12 of the optical system).

1 15. The observing method according to any one of
2 claims 7 to 14, wherein,

3 said observation target is stored in said
4 observing tool so that the numerical aperture of the
5 illumination light against the observation target

6 becomes smaller than the numerical apertures of the
7 objective lens.

1 16. The observing method according to any one of claims
2 7 to 15, wherein,

3 said observation target is stored in said
4 observing tool so that distance d between the
5 observation target and the reflection plane satisfies
6 the following formula (2),

$$7 \quad d > F / (4 \tan (\sin^{-1} NA)) \dots (2)$$

8 (in the formula, d represents the distance between
9 the observation target and the reflection plane, F
10 represents a visual field diameter of the optical
11 system, and NA represents a numerical aperture of the
12 optical system.)